Claims

1-95.   (canceled)

96.   (currently amended)   A method for detecting a target in a sample, comprising:

immobilizing the target in a reaction vessel;

contacting the target with a signal probe, wherein the signal probe comprises a

recognition component and a signal template component, wherein the recognition component

specifically binds directly or indirectly to the target and the signal template codes for a signal

molecule, wherein the signal molecule comprises a recognition head and an electrically charged

tail;

producing the signal molecule using the signal template component coding for the signal

molecule; and

detecting the signal molecule at a detection surface, wherein the detection surface

comprises an affinity binding molecule and a spacer molecule, wherein the recognition head of

the signal molecule specifically binds to the affinity binding molecule and the electronically

charged tail of the signal molecule brings a charge to the detection surface that is detected and

indicates the presence of the target in the sample.

97.   (original)   The method of claim 96, further comprising removing any signal

probe that is not specifically bound to the target immobilized in the reaction vessel.

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98.   (original)   A method of detecting biological substances, comprising:

interacting a biological sample with a plurality of transistors in a circuit, each transistor

having a gate, the circuit including an electrical signal; and

modifying electrical properties of the circuit in response to a biological substance in

contact with at least one gate.

99.   (new) The method of claim 96 wherein the detection surface further comprises a

spacer molecule.

100.   (new) The method of claim 96 wherein the recognition component binds directly

to the target.

101.   (new) The method of claim 96 wherein the recognition component binds

indirectly to the target.

102.   (new) The method of claim 96 wherein the affinity binding molecule is

immobilized on the detection surface.

103.   (new) The method of claim 102 wherein the affinity binding molecule is directly

immobilized on the detection surface.

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104.   (new)   The method of claim 102 wherein the affinity binding molecule is indirectly immobilized on the detection surface.

105.   (new)   The method of claim 96 wherein the affinity binding molecule is an organic molecule or a biomolecule.

106.   (new)   The method of claim 105 wherein the affinity binding molecule comprises a protein.

107.   (new)   The method of claim 106 wherein the affinity binding molecule comprises an antibody.

108.   (new)   The method of claim 105 wherein the affinity binding molecule comprises a nucleic acid.

109.   (new)   The method of claim 99 wherein the spacer molecule is directly immobilized on the detection surface.

110.   (new)   The method of claim 109 wherein the spacer molecule is a non-polymeric organic molecule.

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111.   (new)   The method of claim 109 wherein the spacer molecule is a polymeric organic molecule.

112.   (new)   The method of claim 96 wherein the signal molecule comprises an RNA transcript.

113.   (new)   The method of claim 96 wherein the signal molecule comprises a tag peptide.

114.   (new)   The method of claim 96 wherein the signal molecule comprises a biotinylated antigen.

115.   (new)   The method of claim 96 wherein the signal molecule comprises an RNA aptamer that specifically binds to the affinity binding molecule.

116.   (new)   The method of claim 96 wherein the signal template component comprises a DNA template.

117.   (new)   The method of claim 96 wherein the recognition component comprises one of the group consisting of an antibody, an antigen, an enzyme, a nucleic acid, a polypeptide, and a substrate that specifically binds to a polypeptide.

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118.   (new)   The method of claim 96 wherein the target is selected from the group consisting of a nucleic acid, a polypeptide, a carbohydrate, a lipid, a cell, and a virus.

119.   (new)   The method of claim 96 wherein the electrically charged tail comprises a nucleic acid or a polypeptide.

120.   (new)   The method of claim 119 wherein the electrically charged tail comprises a poly-A tail.

121.   (new)   The method of claim 96 wherein the detection surface comprises a semiconductor material.

122.   (new)   The method of claim 121 wherein the semiconductor material comprises silicon, silicone dioxide, or a polysilicon.

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